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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte SHAHRAM MOSTAFAZADEH and JOSEPH O. SMITH

Appeal 2009-004238
Application 10/016,750
Technology Center 2800

Decided: August 27, 2009

Before ALLEN R. MACDONALD, *Vice Chief Administrative Patent Judge*,
FRED E. MCKELVEY, *Senior Administrative Patent Judge*, and
JOHN A. JEFFERY, *Administrative Patent Judge*.

JEFFERY, *Administrative Patent Judge*.

DECISION ON APPEAL¹

Appellants appeal under 35 U.S.C. § 134(a) from the Examiner's rejection of claims 11-23. Claims 1-10 have been indicated as containing allowable subject matter. App. Br. 1. We have jurisdiction under 35 U.S.C. § 6(b). We affirm.

¹ Throughout this opinion, we refer to (1) the Appeal Brief filed September 9, 2008; (2) the Examiner's Answer mailed October 6, 2008; and (3) the Reply Brief filed October 24, 2008.

STATEMENT OF THE CASE

Appellants invented an integrated circuit (IC) module with a modified lead frame having a die attach platform and plural bus bars surrounding the die attach platform. Specifically, bus bars provide a common connection area for shared power, ground, or communications signals. By connecting all I/O pads on an IC chip to a single bus bar, multiple I/O pads can be serviced by a single interconnection.² Claim 11 is illustrative with a key limitation emphasized:

11. An integrated circuit package comprising:

a lead frame including a die attach platform, a plurality of contacts that are spaced apart from the die attach platform and a bus bar that is positioned between the die attach platform and at least some of the contacts, wherein bottom surfaces of the die attach platform, the contacts and the bus bar are substantially co-planar, and wherein each of the contacts includes a portion that forms an *attachment pad*;

a die carried by the die attach platform and electrically connected to the bus bar and at least some of the contacts; and

a protective casing covering the die and the lead frame while leaving bottom surfaces of the die attach platform, the bus bar and the conductive contacts exposed, wherein encapsulation material that forms the protective casing is exposed at a bottom surface of the package to physically isolate the bus bar from at least some of the conductive contacts, whereby the attachment pads are exposed at the bottom surface of the package.

² See generally U.S. Pat. 6,034,423, Abstract; col. 2, ll. 29-39.

THE REJECTION

The Examiner rejected claims 11-23³ under 35 U.S.C. § 251 as improperly recapturing surrendered subject matter. Ans. 3-4. According to the Examiner, reissue claims 11-23 omit a feature that was critical in allowing the claims during prosecution of the original application, namely that the elongated leads include a *circular* portion formed as an attachment pad. The Examiner reasons that omitting the *circular* attachment pad structure in the claims of the reissue application impermissibly recaptures subject matter that was surrendered to distinguish over prior art cited in the original application. Ans. 4-6.

Regarding representative claim 11,⁴ Appellants admit that the claim is broader in an aspect related to subject matter surrendered during prosecution of the original patent, namely the presence of attachment pads (Reply Br. 1-2). Nevertheless, Appellants argue that this broadening does not impermissibly recapture the surrendered subject matter since the claims merely intend to broaden the scope of the attachment pad feature that was

³ Although the Examiner omits claim 23 in the statement of the rejection (Ans. 3), the Examiner nonetheless includes claim 23 in the Answer in connection with the rejection. See Ans. 6. Moreover, Appellants indicate that claim 23 stands rejected under § 251 in the “Status of the Claims” section of the Appeal Brief (App. Br. 1)—a status that the Examiner confirms as correct (Ans. 2). Accordingly, we presume that the Examiner intended to include claim 23 in the rejection.

⁴ Appellants argue the following claim groupings separately: (1) claims 11-14; (2) claims 15 and 16; (3) claims 17 and 18; (4) claim 19; (5) claim 20; (6) claims 21 and 22; and (7) claim 23. See App. Br. 4-13. Accordingly, we treat each group separately, and select claims 11, 15, 17, and 21 as representative of groups (1), (2), (3), and (6), respectively. See 37 C.F.R. § 41.37(c)(1)(vii).

added during prosecution of the original patent. Appellants emphasize that since reissue claim 11 retains the requirement of attachment pads—a feature not in the original claims—the claim is narrower in relevant part than the cancelled claims in the original application. As such, merely broadening this feature is proper since it does not recapture the full scope of surrendered subject matter in view of the guidelines indicated in the Manual of Patent Examination Procedure (MPEP) and *Ex Parte Eggert*, 67 USPQ2d 1716 (BPAI 2003). App. Br. 4-7; Reply Br. 1-3.

Appellants also argue that claim 11 is materially narrowed in other respects beyond the attachment pad feature, namely that:

- (1) the bottom surfaces of the die attach platform, the contacts and the bus bar are substantially co-planar;
- (2) a protective casing covers the die and lead frame physically isolating the bus bar from at least some of the conductive contacts; and
- (3) the bottom surfaces of the die attach platform, the bus bar and the contacts are exposed at the bottom surface of the package.

App. Br. 7; Reply Br. 4.

Appellants make similar arguments with respect to independent claim 23. App. Br. 12-13; Reply Br. 6.

Appellants also argue that representative claim 15 likewise includes limitations that are narrower in relevant part than original claim 1, namely (1) ground pads on the die that are electrically connected to the die attach platform, and (2) a printed circuit board that is directly electrically connected to the die attach platform. App. Br. 8; Reply Br. 6-7.

Additionally, Appellants argue that representative claim 17 likewise includes limitations that are narrower in relevant part than original claim 1, namely that the bus bar is directly electrically connected to the printed circuit board. App. Br. 8-9; Reply Br. 7.

Appellants also argue that representative claim 19 includes limitations that materially narrow the scope of the claim relative to that of the issued claims of the original patent, namely that:

- (1) the bottom surfaces of the die attach platform and the contacts be substantially co-planar;
- (2) a protective casing covers the die and lead frame physically isolating the die attach platform from at least some of the conductive contacts;
- (3) the bottom surfaces of the die attach platform and the contacts are exposed at the bottom surface of the package; and
- (4) the die attach platform is electrically connected to a ground on a printed circuit board.

App. Br. 9-10; Reply Br. 5.

Appellants make similar arguments regarding dependent claim 20 which requires a direct electrical connection between the ground on a printed circuit board and a die attach platform. App. Br. 11; Reply Br. 7.

Appellants add that dependent claim 21 likewise materially narrows the claim scope by including a direct electrical connection between the bus bar and the printed circuit board. App. Br. 11; Reply Br. 7.

The issues before us, then, are as follows:

ISSUES

Under § 251, have Appellants shown that the Examiner erred in rejecting claims 11-23 by finding that the claims improperly recapture surrendered subject matter? This main question turns on the following issues:

(1) Have Appellants shown that the Examiner erred in finding that Appellants' omitting the circular attachment pad limitation in the reissue claims—a broadening that is related to the surrendered subject matter—constitutes an improper recapture of the surrendered subject matter notwithstanding Appellants' narrowing the claims in other respects?

(2) Are the narrowing limitations of claims 11, 15, 17, 19, 20, 21, and 23 directed to “overlooked aspects” of the disclosed invention so as to materially narrow the reissue claims in other respects and avoid recapture?

FINDINGS OF FACT

The record supports the following findings of fact (FF) by a preponderance of the evidence:

Prosecution History of the Parent Application

1. Application 09/054,380 (“the parent application”) was filed April 2, 1998 and contained claims 1-10 directed to an integrated circuit package (claims 1-9) and a lead frame ball grid array package (claim 10).

2. On January 21, 1999, the Examiner rejected the claims under 35 U.S.C. §§ 102 and 103 over two prior art references, Mizobe (Japanese

Appl'n 3-166756 A) and Barrow (U.S. Pat. 5,796,589). Parent Appl'n, Non-Final Rej. mailed Jan. 21, 1999, at 2-4.

3. On July 12, 1999, Appellants amended independent claims 1 and 9 to call for, among other things, (1) each lead to include a circular portion formed as an attachment pad, and (2) a substrate with vias of non-circular cross sections to allow electrical connections between first and second surfaces of the substrate. Parent Appl'n, Amdt filed July 12, 1999, at 1-3.

4. In the Remarks accompanying this amendment, Appellants indicate the following:

[T]he circular attachment pads allows [sic] the use of non-circular vias that can be formed without the difficulties in the prior art of forming circular vias, and thus resulting in consistent post-installation solder ball profiles. Since neither the circular pads and the vias of non-circular cross sections nor their attendant benefits are disclosed or suggested by Mizobe . . . or Barrow . . . , Applicants believe that Claim 1 and its dependent Claims 2-8 and 11 are each patentable over Mizobe, Barrow or their combination.

Parent Appl'n, Amdt filed July 12, 1999, at 4.

5. On September 27, 1999, the Examiner allowed claims 1-9 and 11. Notice of Allowability, mailed Sept. 27, 1999, at 1.

6. The Notice of Allowability indicates that it is responsive to "amendment a dated 7/12/99" [sic]. *Id.*

7. U.S. Patent 6,034,423 ("the '423 patent") issued March 7, 2000 following the Examiner's allowance of the claims.

Prosecution of the Reissue Application

8. Appellants filed the present application on December 10, 2001 to reissue the '423 patent.

9. Appellants originally declared that the '423 patent "is partly inoperative as the patent claims less than I had a right to claim in the patent. As an example, the patent failed to broadly claim the bus bar in an exposed lead environment aspect of the invention." Reissue Decl. filed Dec. 10, 2001, at 1.

10. On March 20, 2007, the Examiner rejected the claims based on a defective reissue declaration. Non-final Rej. mailed Mar. 20, 2007, at 2-3.

11. On June 12, 2007, Appellants filed a Supplemental Declaration that included the same error to be corrected in the original reissue declaration (FF 9), but added the following:

I believe the original claim set was in error and partially inoperative at least in part because all of the originally granted independent claims specifically required that each of the leads include a "circular portion formed as an attachment pad" and that such limitations are unduly limiting in the context of claims directed at the bus bar feature (e.g., new claim 11).

Supp. Decl. filed June 12, 2007, at 1-2.

12. On October 19, 2007, the Examiner rejected claims 11-22 as improperly recapturing surrendered subject matter. Non-Final Rej. mailed Oct. 19, 2007, at 2-3.

13. Following a response to this rejection from Appellants, the Examiner maintained the recapture rejection and made it final. Final Rej. mailed May 13, 2008, at 2-3.

14. Appellants appealed the final rejection. Notice of Appeal, filed July 30, 2008.

The Appeal Brief

15. In the Summary of the Claimed Subject Matter section of the Appeal Brief, Appellants refer to Figures 2c-1, 2c-2, 2d-1, and 2d-2 of the '423 patent in connection with the limitations of claims 11, 19, and 23. App. Br. 2-3. Appellants also refer to various passages of that patent in column 3 from (1) lines 26 to 44 in connection with the limitations of claim 11, and (2) lines 26 to 51 in connection with the limitations of claims 19 and 23. *Id.*

16. Regarding claim 11, Appellants refer to Figure 2d-2 of the '423 patent in connection with the limitations calling for (1) the bottom surfaces of the die attach platform, contacts, and bus bar are substantially co-planar, and (2) the protective casing covering the die and lead frame while leaving portions of the die attach platform, bus bar, and contacts exposed. App. Br. 2.

17. Appellants also refer to Figure 2d-2 of the '423 patent in connection with commensurate limitations of claims 19 and 23. App. Br. 3.

18. Regarding claim 11, Appellants refer to Figures 2d-1, 2d-2, and col. 3, lines 38-44 of the '423 patent in connection with the limitation calling for exposing the attachment pads at the bottom surface of the package. App. Br. 2.

19. Appellants also refer to Figures 2d-1, 2d-2, and column 3, lines 38-44 of the '423 patent in connection with commensurate limitations of claim 19. App. Br. 3.

20. Appellants refer to Figures 2d-1, 2d-2, and column 3, lines 38-44 and 48-51 in connection with the limitations of claim 23 calling for (1) the encapsulation material that forms the protective casing is exposed at a bottom surface of the package, and (2) attaching the IC package to a substrate by soldering the attachment portions of the lead frame to the substrate. App. Br. 3.

21. Appellants refer to Figure 2d-2 of the '423 patent in connection with the limitation of claims 11 and 23 calling for each contact to include a portion forming an attachment pad. App. Br. 2-3.

22. Appellants also refer to Figure 2d-2 of the '423 patent in connection with commensurate limitations of claim 19, but additionally refer to Figure 2d-1. App. Br. 3.

23. Appellants refer to column 3, lines 48-51 in connection with the limitation in claim 19 calling for the die attach platform that is directly electrically connected to the ground on the printed circuit board. App. Br. 3.

The '423 Patent

24. Figures 2c and 2d of the '423 patent illustrate an embodiment of the disclosed invention incorporated into a lead frame ball grid array (BGA) package ("the BGA embodiment"). '423 Patent, col. 2, ll. 60-61; col. 3, ll. 24-26.

25. Figures 2a and 2b illustrate an embodiment of the disclosed invention incorporated into a pin-type IC module. '423 Patent, col. 2, ll. 58-59; col. 3, ll. 5-7.

26. Figures 2c and 2d and the corresponding discussion pertaining to the BGA embodiment are discussed in a single paragraph in the '423 patent. '423 patent, col. 3, ll. 24-56.

PRINCIPLES OF LAW

Under the recapture rule, Appellants are precluded from regaining subject matter that was surrendered to obtain allowance of the original claims. *North Am. Container, Inc. v. Plastipak Pkg., Inc.*, 415 F.3d 1335, 1349 (Fed. Cir. 2005) (citing *In re Clement*, 131 F.3d 1464, 1468 (Fed. Cir. 1997)).

The recapture rule is applied as a three-step process to determine:

- (1) whether, and in what respect, the reissue claims are broader in scope than the original patent claims;
- (2) whether the reissue claims relate to the subject matter surrendered in the original prosecution; and
- (3) whether the reissue claims were materially narrowed in other respects, so that the claims may not have been enlarged, and hence avoid the recapture rule. *North Am. Container*, 415 F.3d at 1349.

A limitation “materially narrows” the reissue claims if the narrowing limitation is directed to one or more “overlooked aspects” of the invention. *Hester Indus., Inc. v. Stein, Inc.*, 142 F.3d 1472, 1482-83 (Fed. Cir. 1998).

The Manual of Patent Examining Procedure provides:

If surrendered subject matter has been entirely eliminated from a claim in the reissue application, or has been in any way broadened in a reissue application claim, then a recapture rejection under 35 U.S.C. § 251 is proper and must be made for that claim.

If, however, the reissue claim(s) are really claiming additional inventions/embodiments/species not originally claimed (i.e., overlooked aspects of the disclosed invention), then recapture will not be present.

MPEP § 1412.02(I)(C), Rev. 7, July 2008.

ANALYSIS

Claims 11-14

We begin by noting that it is undisputed that (1) the reissue claims are broader than the patented claims with respect to the attachment pad limitation (i.e., by omitting the requirement that the pads have circular portions), and (2) this broadening relates to the subject matter surrendered during prosecution of the original patent. Reply Br. 1-2. Rather, the dispute before us hinges on the third prong of the test outlined in *North American Container*, namely whether the reissue claims were materially narrowed in other respects so as to avoid the recapture rule. See *North Am. Container*, 415 F.3d at 1349.

The Examiner's position is based primarily on the alleged impropriety of omitting the circular portion limitation which, according to the Examiner, was critical in overcoming the prior art rejections in the parent application.

Ans. 4-6. According to the Examiner, adding this critical limitation to the claims in that application was the reason the Examiner allowed the claims. *Id.*

The record confirms this criticality. In response to the Examiner's prior art rejection in the parent application (FF 2), Appellants amended the independent claims to call for, among other things, (1) each lead to include a *circular portion* formed as an attachment pad, and (2) a substrate with vias of non-circular cross sections. FF 3 (emphasis added). Notably, in the Remarks accompanying this amendment, Appellants emphasize the advantages of circular attachment pads, namely by allowing non-circular vias to be used. FF 4. Appellants explain that forming non-circular vias overcomes the difficulties of forming circular vias, therefore resulting in consistent post-installation solder ball profiles. *Id.*

The clear import of this discussion is that circular attachment pads are critical features of the invention to enable using non-circular vias (and therefore realize their advantages over circular vias). That the Examiner allowed the application in response to this amendment (FF 5-6) all but indicates that the Examiner relied on this amendment and accompanying explanation in issuing the application.

Appellants, however, take the position that broadening the attachment pad limitation via reissue does not impermissibly recapture surrendered subject matter since the claims retain the previously-added attachment pad limitation in a broader form, and cite *Ex parte Eggert* and various sections of the MPEP to support their argument (App. Br. 4-7; Reply Br. 2-3).

But *Eggert* is no longer viable,⁵ and we therefore decline to follow its holding. Furthermore, Appellants' citations to the MPEP in the Briefs do not reflect the latest version of the MPEP (Rev. 7, July 2008)—a revision that *predates* when the Briefs were filed.⁶ While some of the text in the quoted passage from MPEP § 1412.02(I)(C) on Pages 2 and 3 of the Reply Brief appears in the latest version of the MPEP, a substantial portion of that section has significantly changed, including deleting the discussion pertaining to *Eggert*. Compare MPEP § 1412.02(I)(C), Rev. 7, July 2008 with MPEP § 1412.02(I)(C), Rev. 5, Aug. 2006. As such, Appellants' arguments based on *Eggert* and the cited MPEP passages are simply no longer applicable and therefore inapposite.

Indeed, the Examiner's position seemingly comports with the latest version of the MPEP which indicates that impermissible recapture results if the reissue claim omits *or broadens* any limitation that was added/argued during the original prosecution to overcome an art rejection, even if it includes other limitations that narrow the claim in other aspects. MPEP § 1412.02(I)(C), Rev. 7, July 2008 (emphasis added); *see also id.* ("If surrendered subject matter has been entirely eliminated from a claim in the

⁵ *Ex parte Liebermann*, No. 2007-0012, 2007 WL 5211672 (BPAI 2007) (Informative), at *11-12, available at <http://www.uspto.gov/web/offices/dcom/bpai/its/fd070012.pdf> (noting that *Eggert* is inconsistent with the rationale expressed in *North American Container* and should no longer be followed or apply to USPTO proceedings). *Accord Ex parte Olson*, No. 2008-6351, 2009 WL 1817909 (BPAI 2009) (non-precedential), at *10-11 (citing cases).

⁶ The Appeal Brief was filed September 9, 2008, and the Reply Brief was filed October 24, 2008. *See* n.1, *supra*, of this opinion.

reissue application, *or has been in any way broadened in a reissue application claim*, then a recapture rejection under 35 U.S.C. 251 is proper and must be made for that claim.”) (emphasis added).

Nevertheless, since claim 11 contains limitations that were not present in the issued claims of the ‘423 patent, we must determine whether these limitations materially narrow the reissue claims in other respects so as to avoid recapture. *North Am. Container*, 415 F.3d at 1349. A limitation “materially narrows” the reissue claims if the narrowing limitation is directed to one or more “overlooked aspects” of the invention. *Hester*, 142 F.3d at 1482-83.

According to Appellants, the following limitations materially narrow claim 11 so as to avoid recapture:

- (1) the bottom surfaces of the die attach platform, the contacts and the bus bar are substantially co-planar;
 - (2) a protective casing that covers the die and lead frame physically isolating the bus bar from at least some of the conductive contacts;
 - and
 - (3) the bottom surfaces of the die attach platform, the bus bar and the contacts are exposed at the bottom surface of the package.
- Reply Br. 4.

To be sure, these limitations narrow the scope of the issued claims in a manner distinct from the attachment pad feature. Nor were these limitations prosecuted in the parent application, and in that sense, they were

“overlooked.”⁷ But we nonetheless do not find these limitations constitute “overlooked aspects” of the invention so as to *materially* narrow the claim in other respects to avoid recapture.

The latest version of the MPEP confirms this point. The MPEP emphasizes that if “the reissue claim(s) are really claiming additional *inventions/embodiments/species* not originally claimed (i.e., *overlooked aspects* of the disclosed invention), then recapture will not be present.” MPEP § 1412.02(I)(C), Rev. 7, July 2008 (emphases added). The MPEP then provides examples of such overlooked aspects. In one example, the MPEP describes an originally-prosecuted method of making a glass lens uses an ion implantation step using a molten bath to diffuse ions into the lens that required an amendment reciting particular pressure and temperature ranges to define over the art—ranges that cannot be deleted or broadened via reissue. *Id.*

But the MPEP notes that if applicant had failed to claim a disclosed embodiment to a plasma ion implementation (i.e., using a plasma stream rather than a molten bath), then applicant can add claims directed to this embodiment via reissue without the particular temperature and pressure ranges that were added with respect to the originally-prosecuted molten bath embodiment. *Id.* These limitations, the MPEP explains, are irrelevant to the plasma species/embodiment despite being germane to the molten bath

⁷ See *Ex parte Bradshaw*, No. 2006-2744, 2007 WL 2138943 (BPAI 2007) (non-precedential), at *9 (noting *Hester’s* exception to the recapture rule as requiring that (1) an aspect of the invention must have been overlooked (e.g., not claimed) during patent prosecution, and (2) the reissue claim must have been materially narrowed with respect to this overlooked aspect).

species/embodiment. *Id.* The MPEP cites a similar example involving a newly-claimed method of placing two lenses made by the invention in a specified series to modulate a laser for cutting chocolate. *Id.*

The clear import of this discussion is that “overlooked aspects” of the invention are additional *patentably-distinct* (1) inventions; (2) embodiments; or (3) species not originally claimed—not mere incidental features of the originally-claimed invention.

We recognize that these incidental features may have been “overlooked” in the sense that they were not originally claimed, and adding them to a reissue claim narrows the claim. But including incidental features in a reissue claim that otherwise recaptures surrendered subject matter does not *materially*⁸ narrow the claim to avoid impermissible recapture. Since these incidental features do not constitute “overlooked aspects” in accordance with the above interpretation, these incidental limitations therefore do not materially narrow the reissue claims to avoid recapture. *See Hester*, 142 F.3d at 1482-83.

Turning to the particular limitations noted above in claim 11, we find that while these originally-unclaimed limitations narrow the reissue claim, they are merely incidental to the disclosed invention, and therefore do not constitute “overlooked aspects” of the invention so as to *materially* narrow the claim in other respects to avoid recapture. Although the co-planar

⁸ The term “material” is defined, in pertinent part, as “[i]mportant; more or less necessary. . . .” Black’s Law Dictionary, 6th ed., 1991. Limiting “overlooked aspects” to patentably-distinct inventions, embodiments, or species reasonably comports with this definition in that narrowing involving these aspects would be important or necessary to cover previously unclaimed inventions, embodiments, or species.

disposition of the die attach platform, the contacts, and the bus bar adds a structural feature that narrows claim 11, this feature is not directed to a patentably-distinct (1) invention; (2) embodiment; or (3) species, and therefore does not constitute an “overlooked aspect” of the invention so as to materially narrow the claim in other respects to avoid recapture.

Related inventions are distinct if (1) the inventions as claimed are not connected in at least one of design, operation, or effect, and (2) at least one invention is patentable (novel and nonobvious) over the other. MPEP § 803(II). But when claims define the same essential characteristics of a single disclosed embodiment of an invention, the “claims are not directed to distinct inventions; rather they are different definitions of the same disclosed subject matter, varying in breadth or scope of definition.” MPEP § 806.03.

That is the case here. Notably, in Summary of the Claimed Subject Matter section of the Appeal Brief, Appellants refer to Figures 2c-1, 2c-2, 2d-1, and 2d-2 of the ‘423 patent in connection with the limitations of claims 11, 19, and 23. FF 15. These figures and their associated discussion, however, pertain to a single embodiment—namely, a lead frame BGA package. *See* FF 24 and 26. This embodiment is distinct from another embodiment in the ‘423 patent directed to a pin-type IC module. *Compare* FF 24 *with* FF 25.

In the Appeal Brief, Appellants refer to figures in the ‘423 patent pertaining solely to the BGA embodiment in connection with the particular narrowing limitations added to claim 11. Specifically, Appellants refer to Figure 2d-2 of the ‘423 patent in connection with the added limitations calling for (1) the bottom surfaces of the die attach platform, contacts, and bus bar are substantially co-planar, and (2) the protective casing covering the

die and lead frame while leaving portions of the die attach platform, bus bar, and contacts exposed. FF 16. Appellants likewise refer to Figure 2d-2 of the '423 patent in connection with the added limitation calling for exposing the attachment pads at the bottom surface of the package, but further cite Figure 2d-1 and a passage from the patent pertaining to the BGA embodiment. *See* FF 18 and 26. Thus, the narrowing limitations added to claim 11 via reissue pertain to the same BGA embodiment—the same embodiment that Appellants also refer to in connection with the broadened attachment pad feature. *See* FF 21 and 26.

Despite these narrowing limitations, claim 11 nonetheless defines the same essential characteristics of the BGA embodiment as the patented claims, namely the recited structure of the lead frame, contacts, attachment pad structure, bus bar, and die. As such, claim 11 does not pertain to a patentably-distinct invention, embodiment, or species, but is merely a different definition of the same subject matter, namely a narrower scope of definition. *See* MPEP § 806.03. Since the additional features added via these narrowing limitations are merely incidental to these essential characteristics, they are not “overlooked aspects” of the invention so as to *materially* narrow the claim in other respects to avoid recapture. *See* MPEP § 1412.02(I)(C).

For the foregoing reasons, Appellants have not persuaded us of error in the Examiner’s rejection of representative claim 11. Therefore, we will sustain the Examiner’s rejection of that claim, and claims 12-14 which fall with claim 11.

Claims 15 and 16

We reach a similar conclusion regarding representative claim 15 which incorporates claim 11 by reference. Although the recited features calling for (1) ground pads on the die that are electrically connected to the die attach platform, and (2) a printed circuit board that is directly electrically connected to the die attach platform narrow the claim, these features are merely incidental to the essential characteristics of the BGA embodiment and are therefore not directed to patentably-distinct inventions, embodiments, or species. These incidental features therefore do not constitute “overlooked aspects” of the invention so as to materially narrow the claim in other respects to avoid recapture.

Furthermore, the ground pad limitation was, in fact, recited in original claim 4 of the parent application which called for, in pertinent part, “a plurality of ground I/O pads . . . said plurality of ground I/O pads are electrically connected to said die attach platform.” Since this limitation was claimed in the original application, it is not an “overlooked aspect” for this additional reason. *See Hester*, 142 F.3d at 1482-83.

For the foregoing reasons, Appellants have not persuaded us of error in the Examiner’s rejection of representative claim 15. Therefore, we will sustain the Examiner’s rejection of that claim, and claim 16 which falls with claim 15.⁹

⁹ Although Appellants separately argue claim 16 on Page 7 of the Reply Brief, Appellants did not separately argue this claim in the Appeal Brief. *Compare* App. Br. 8 *with* Reply Br. 7. Since Appellants did not argue claim 16 with particularity in their opening brief—let alone the particular arguments pertaining to this claim in the Reply Brief—these arguments are deemed waived. *See Optivus Tech., Inc. v. Ion Beam Appl’ns S.A.*, 469 F.3d

Claims 17 and 18

We likewise will sustain the Examiner's rejection of claim 17 which incorporates claim 11 by reference. Although the recited feature calling for the bus bar to be directly electrically connected to the printed circuit board narrows the claim, for the reasons indicated previously, this feature is merely incidental to the essential characteristics of the BGA embodiment, and is therefore not directed to a patentably-distinct invention, embodiment, or species. Accordingly, this incidental feature does not constitute an "overlooked aspect" of the invention so as to materially narrow the claim in other respects to avoid recapture.

For the foregoing reasons, Appellants have not persuaded us of error in the Examiner's rejection of representative claim 17. Therefore, we will sustain the Examiner's rejection of that claim, and claim 18 which falls with claim 17.

Claim 19

We will also sustain the Examiner's rejection of independent claim 19 which adds the following features:

978, 989 (Fed. Cir. 2006) ("[A]n issue not raised by an appellant in its opening brief . . . is waived.") (citations and quotation marks omitted).

We reach a similar conclusion with respect to claim 18 which was not separately argued in the Appeal Brief, but was separately argued in the Reply Brief. *Compare* App. Br. 8-9 *with* Reply Br. 7. Appellants' newly-raised arguments with respect to claim 22 (Reply Br. 7) are waived for similar reasons. *Compare* App. Br. 11-12 *with* Reply Br. 7.

(1) the bottom surfaces of the die attach platform and the contacts are substantially co-planar;

(2) a protective casing covers the die and lead frame physically isolating the die attach platform from at least some of the conductive contacts;

(3) the bottom surfaces of the die attach platform and the contacts are exposed at the bottom surface of the package; and

(4) the die attach platform is electrically connected to a ground on a printed circuit board.

These features, however, are not directed to patentably-distinct inventions, embodiments, or species and therefore do not constitute “overlooked aspects” of the invention so as to materially narrow the claim in other respects to avoid recapture.

As we indicated previously with respect to claim 11, Appellants’ reference to the particular disclosure in the ‘423 patent in connection with the limitations of claim 19 (including the narrowing limitations above) pertains to the BGA embodiment. *See* FF 15, 17, 19, 22, 23, and 26. For the reasons discussed previously, these features are merely incidental to the essential characteristics of the BGA embodiment, and therefore not directed to a patentably-distinct invention, embodiment, or species. Accordingly, the added features do not constitute “overlooked aspects” of the invention so as to materially narrow the claim in other respects to avoid recapture.

For the foregoing reasons, Appellants have not persuaded us of error in the Examiner’s rejection of claim 19. Therefore, we will sustain the Examiner’s rejection of that claim.

Claim 20

We likewise will sustain the Examiner's rejection of claim 20. Although the recited feature calling for a direct electrical connection between the ground on a printed circuit board and a die attach platform narrows the claim, for the reasons indicated previously, this feature is merely incidental to the essential characteristics of the BGA embodiment, and is therefore not directed to a patentably-distinct invention, embodiment, or species. Accordingly, this incidental feature does not constitute an "overlooked aspect" of the invention so as to materially narrow the claim in other respects to avoid recapture.

For the foregoing reasons, Appellants have not persuaded us of error in the Examiner's rejection of claim 20. Therefore, we will sustain the Examiner's rejection of that claim.

Claims 21 and 22

We likewise will sustain the Examiner's rejection of representative claim 21. Although the recited feature calling for a bus bar positioned between the die attach platform and at least some of the contacts wherein the bus bar is directly electrically connected to the printed circuit board narrows the claim, for the reasons indicated previously, this feature is merely incidental to the essential characteristics of the BGA embodiment, and is therefore not directed to a patentably-distinct invention, embodiment, or species. Accordingly, this incidental feature does not constitute an "overlooked aspect" of the invention so as to materially narrow the claim in other respects to avoid recapture.

For the foregoing reasons, Appellants have not persuaded us of error in the Examiner's rejection of representative claim 21. Therefore, we will sustain the Examiner's rejection of that claim, and claim 22 which falls with claim 21.

Claim 23

We will also sustain the Examiner's rejection of independent claim 23 which adds the following features:

- (1) the bottom surfaces of the die attach platform, the contacts and the bus bar are substantially co-planar;
- (2) a protective casing covers the die and lead frame physically isolating the bus bar from at least some of the conductive contacts;
- (3) the bottom surfaces of the die attach platform, the bus bar and the contacts are exposed at the bottom surface of the package; and
- (4) the integrated circuit package may be attached to a substrate by soldering the attachment portions of the lead frame to the substrate.

As we indicated previously with respect to claims 11 and 19, Appellants' reference to the particular disclosure in the '423 patent in connection with the limitations of claim 23 (including the narrowing limitations above) pertains to the BGA embodiment. *See* FF 15, 17, 20, and 26. For the reasons discussed previously, these features are merely incidental to the essential characteristics of the BGA embodiment, and therefore not directed to a patentably-distinct invention, embodiment, or species. Accordingly, the added features do not constitute "overlooked aspects" of the invention so as to materially narrow the claim in other respects to avoid recapture.

These features, however, are not directed to patentably-distinct inventions, embodiments, or species and therefore do not constitute “overlooked aspects” of the invention so as to materially narrow the claim in other respects to avoid recapture.

For the foregoing reasons, Appellants have not persuaded us of error in the Examiner’s rejection of claim 23. Therefore, we will sustain the Examiner’s rejection of that claim.

CONCLUSION

Appellants have not shown that the Examiner erred in rejecting claims 11-23 under § 251.

ORDER

The Examiner’s decision rejecting claims 11-23 is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED

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